

REMARKS

In view of the above amendments and the following remarks, Applicant requests favorable reconsideration of this application.

Claims 4-13 and 15-17 remain pending in this application, with Claims 12 and 13 being independent. By this Amendment, Applicant has amended the specification and Claims 7, 8, 12 and 13. No new matter has been added.

The specification and Figures 1B, 2B and 7- 9 stand objected to because of formal matters. Applicant has amended those figures and the specification to attend to the matters set forth in the Office Action as giving rise to the objections. Accompanying this Amendment is a Submission of Replacement Drawing Sheets, setting forth the changes to the figures. Accordingly, Applicant requests withdrawal of the objection.

Claims 7 and 8 stand objected to for informalities. Applicant has amended those claims to attend to the informalities. Accordingly, Applicant requests withdrawal of this objection as well.

Claims 4-13 and 15-17 stand rejected under 35 U.S.C. § 103 over U.S. Patent No. 4,614,433 (Feldman, et al.), 5,161,059 (Swanson, et al.) and 5,294,980 (Matsugu, et al.). Applicant traverses this rejection.

As recited in independent Claim 12, Applicant's invention is directed to a device manufacturing method. The method includes an exposing step and a developing step. The exposing step involves exposing a substrate with a pattern by use of a light having a wavelength  $\lambda$  and by use of an exposure apparatus having a diffractive optical element. The diffractive element includes a diffractive surface for diffracting

predetermined light corresponding to the wavelength  $\lambda$ , and an alignment mark formed in a portion of the diffractive surface. As regards to the predetermined light, a phase difference corresponding to a multiple of the wavelength  $\lambda$  is produced between (i) a light ray of the predetermined light as transmitted through or reflected by the alignment mark, and (ii) a light ray of the predetermined light as transmitted through or reflected by a portion adjacent to the alignment mark. With regard to a second light of a second wavelength  $\lambda'$ , different from the wavelength  $\lambda$ , no phase difference corresponding to a multiple of the second wavelength  $\lambda'$  is produced between (a) a light ray of the second light, as transmitted through or reflected by the alignment mark, and (b) a light ray of the second light, as transmitted through or reflected by a portion adjacent to the alignment mark. A position of the alignment mark is detected by using the light of the second wavelength.

Independent Claim 13 is directed to a diffractive element and corresponds generally to the content of independent Claim 12.

Thus, with the above-described invention, the alignment mark formed on a portion of the diffractive surface is preferably used such that it is detected through the use of light having a wavelength  $\lambda'$ , to provide for accurate positional detection. With the use of light of wavelength  $\lambda$ , however, the light behaves as if the mark is absent.

The Official Action cites Feldman, et al. as describing a diffractive surface and an alignment mark. Applicant submits, however, that Feldman, et al. describes that a diffractive surface (i.e., zone plate) is used *as* an alignment mark. In the present invention, a portion of the diffractive surface *includes* an alignment mark. Applicant submits that

Feldman, et al. does not describe that part of the zone plate includes a specific alignment mark.

Applicant also submits that Matsugu, et al. is similar to Feldman, et al. in that it describes the use of a diffractive surface as an alignment mark, but does not describe that a diffractive surface includes, on a portion thereof, an alignment mark. In addition, Applicant also notes that the Official Action merely cites this document as showing the use of a diffractive surface in an exposure apparatus.

Swanson, et al. is cited in the Official Action as describing that phase is related to the wavelength. Specifically, the Official Action cites column 1, lines 45-50, for this proposition. Applicant submits that that section of the specification merely describes that, for improvement of diffractive efficiency, the phase profile of a wavefront passing through the diffractive optical element should be continuous. The present invention, as recited in independent Claims 12 and 13, defines a specific relationship between the alignment mark, a position adjacent the alignment mark and two different wavelengths of light. Applicant submits that Swanson, et al. does not describe this specific relationship, as recited in independent claims.

Accordingly, Applicant submits that Feldman, et al., Matsugu, et al. and Swanson, et al., taken alone or in combination, fail to disclose or suggest at least the features of an alignment mark formed in a portion of a diffractive surface, wherein, with regard to a predetermined light, a phase difference corresponding to a multiple, by an integer, of a wavelength  $\lambda$  is produced between (i) a light ray, of the predetermined light, as transmitted through or reflected by the alignment mark and (ii) a light ray, of the

predetermined light, as transmitted through or reflected by a portion adjacent to the alignment mark, and that, with regard to a second light of a second wavelength  $\lambda'$ , different from the wavelength  $\lambda$ , no phase difference corresponding to a multiple, by an integer, of the second wavelength  $\lambda'$  is produced between (a) a light ray, of the second light, as transmitted through or reflected by the alignment mark and (b) a light ray, of the second light, as transmitted through or reflected by a portion adjacent to the alignment mark, as generally recited in independent Claims 12 and 13.

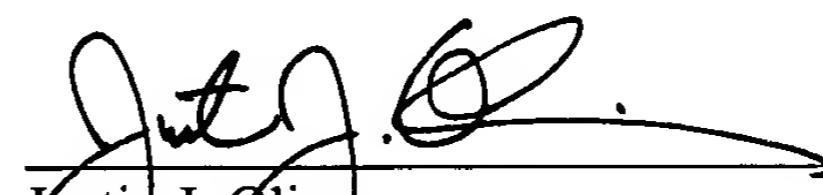
For the foregoing reasons, Applicant submits that the independent claims are allowable over the applied art.

The remaining claims in the present application are dependent claims which depend from the above-discussed independent claims, and thus are patentable over the applied patents for reasons noted above with respect to those independent claims. In addition, each recites features of the invention still further distinguishing it from the applied patents. Applicant requests favorable and independent consideration thereof.

Accordingly, Applicant requests withdrawal of the rejection under 35 U.S.C. § 103.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,



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